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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,969	08/25/2006	Paul R. Drury	27754/26717	5387
4743	7590	04/06/2009	EXAMINER	
MARSHALL, GERSTEIN & BORUN LLP			ANGWIN, DAVID PATRICK	
233 SOUTH WACKER DRIVE				
6300 SEARS TOWER			ART UNIT	PAPER NUMBER
CHICAGO, IL 60606-6357			3729	
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			04/06/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,969	DRURY, PAUL R.	
	Examiner	Art Unit	
	DAVID P. ANGWIN	3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 12 January 2009.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-21 is/are pending in the application.
 4a) Of the above claim(s) 12-17 and 20 is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-11, 18-19, and 21 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 18 January 2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____ .
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date <u>1/18/06 and 2/13/08</u> .	6) <input type="checkbox"/> Other: _____ .

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Species I (Claims 1-11, 18-19, and 21) in the reply filed on 1/12/09 is acknowledged.

Claims 12-17 and 20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

The examiner notes that the applicant has elected multiple species. The examiner reserves the right to further restrict the multiple species elected by the applicant.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. §112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9 and 21 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically:

a. **Claim 9** recites the following limitations that are vague, indefinite, and confusing:

- “and preferably a negative photoresist” (claim 9, line 2) – It is unclear as to whether the claim requires a negative photoresist or not. Please be more precise with the claim language.

Claim Rejections – 35 USC § 103

The following is a quotation of 35 U.S.C. § 103(a) that forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically taught or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. § 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-9, 11, 18, and 21, as best understood, are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Gardner* (US Patent 4,246,076) in view of *Nakazawa et al* (JP Patent Publication H06-206314).

- a. *Gardner* discloses in his reference the following:
 - i. forming a body (Figs. 1-3, items 11 and 21) of a first material said body having a periphery (Figs. 1-3, *outline of items 11 and 21*);
 - ii. forming a plate (Fig. 1d, item 23) of a second material (2:49-50) around said body such that the plate extends around at least a portion of said periphery of said body;
 - iii. the plate is electroformed (2:49-50);

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- iv. said first material is formed as a layer on a substrate said layer being processed to form a plurality of bodies (Figs. 1-3, items 11 and 21; 3:20);
- v. said plurality of bodies are arranged in an array corresponding with the desired array of nozzles in completed nozzle plates;
- vi. the first material is a plastics material (Figs. 1-3; 1:67-2:2);
- vii. the second material is a metal (Figs. 1-3; 2:49-50);
- viii. said first material is a photoresist (2:11-36);
- ix. defining a plurality of distinct bodies of polymeric material distributed over the nozzle plate plane and forming at least one metal nozzle plate layer by electroforming around said bodies of polymeric material (Figs. 1-3);
- x. forming a layer of first photoresist material (Figs. 1-3, item 3) on a substrate (Figs. 1-3, item 1);
- xi. selectively exposing and removing photoresist material to define on the substrate an array of distinct bodies of said first material (Figs. 1-3; 3:20);
- xii. forming a first plate of metal (Figs. 1-3, item 23) around said bodies, so as to form a metal nozzle plate having apertures, each aperture containing a body (Figs. 1-3, items 11 and 21) of said first material; and
- xiii. the first material is a negative photoresist (Figs. 1-3).

- b. Regarding claim 1 and 18, in addition to the above limitations, *Gardner* may not expressly disclose forming a nozzle extending through the body.
 - i. However, *Nakazawa et al* teaches forming a nozzle extending through a body (Figs. 1 and 7-10). The advantage of forming a nozzle extending through a body is to produce a nozzle with less vibration during operation. Therefore, it would have been obvious to form a nozzle extending through a body to produce a nozzle with less vibration during operation.
- c. Regarding claim 5, in addition to the limitations in claim 3, *Gardner* may not expressly disclose masking said layer, exposing said layer to radiation and removing portions of said layer.
 - i. However, *Nakazawa et al* further teaches masking a layer, exposing the layer to radiation, and removing portions of the layer (Figs. 1 and 7-10). The advantage of masking a layer, exposing the layer to radiation, and removing portions of the layer is to form nozzle holes. Therefore, it would have been obvious to mask a layer, expose the layer to radiation, and remove portions of the layer to form nozzle holes.
- d. Regarding claim 6, in addition to the limitations in claim 1, *Gardner* may not expressly disclose forming the nozzle by ablating through the body.
 - i. However, *Nakazawa et al* further teaches forming a nozzle by ablating through a body (Figs. 1 and 7-10). The advantage of forming a nozzle by ablating through a body is to form nozzle holes. Therefore, it would have been obvious to form the nozzle by ablating through the body to form nozzle holes.

Claim 10, as best understood, is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Gardner* (US Patent 4,246,076) in view of *Nakazawa et al* (JP Patent Publication H06-206314) and further in view of *Truninger et al* (US Patent 6,204,182).

- a. Regarding claim 10, *Gardner* as modified may not expressly disclose discloses in his reference attaching a nozzle plate to a droplet deposition apparatus before the nozzle is formed.
 - i. However, *Truninger et al* teaches in her reference attaching a nozzle plate to a droplet deposition apparatus before the nozzles are formed (Figs. 2A-F). The advantage of attaching a nozzle plate to a droplet deposition apparatus before the nozzles are formed is to make an in-situ nozzle plate. Therefore, it would have been obvious to attach a nozzle plate to a droplet deposition apparatus before the nozzles are formed to make an in-situ nozzle plate.

Claim 19, as best understood, is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Gardner* (US Patent 4,246,076) in view of *Nakazawa et al* (JP Patent Publication H06-206314) and further in view of *Chung et al* (US Patent 7,240,433).

- a. Regarding claim 19, *Gardner* as modified may not expressly disclose discloses in his reference depositing a metallic seed layer on the substrate prior to forming the layer of first photoresist material.
 - i. However, *Chung et al* teaches in his reference depositing a metallic seed layer (Fig. 1H, item 46) on the substrate prior to forming the layer of a photoresist material (Fig. 1I, item 50). The advantage of depositing a metallic seed layer on the substrate prior to forming the layer of first photoresist material is to properly electroform the nozzle plate. Therefore, it would have been obvious to deposit a metallic seed layer on the substrate prior to forming the layer of first photoresist material to properly electroform the nozzle plate.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David P. Angwin, whose telephone number is (571) 270-3735. The examiner can normally be reached on 7:30 AM - 5 PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bryant, can be reached on 571-272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. Dexter Tugbang/
Primary Examiner
Art Unit 3729

DPA
April 2, 2009